REMARKS

In view of the following discussion, the Applicants submit that none of the claims now pending in the application are unpatentable under the judicially created doctrine of obviousness-type double patenting or under the provisions of 35 U.S.C. § 103. Thus, the Applicants believe that all of these claims are now in condition for allowance.

I. REJECTION OF CLAIMS 42, 49 AND 50 UNDER JUDICIALLY CREATED DOCTRINE OF DOUBLE PATENTING

The Examiner rejected claims 42 and 49 under judicially created doctrine of double patenting over claims 1-24 of U.S. Patent 6,654,563, issued on November 25, 2003, hereinafter referred to as "Darcie" in view of US Patent 6,523,177, issued on February 18, 2003, hereinafter referred to as "Brown" and further in view of US Patent 6,147,786, issued on November 14, 2000, hereinafter referred to as "Pan" and claims 1-8 of US Patent 6,751,417, issued on June 15, 2004, hereinafter referred to as "Combs" in view of Brown. In response, the Applicants provisionally agree to file a terminal disclaimer, if necessary, to overcome the present judicially created doctrine of double patenting rejection when all other rejections against the pending claims of the present invention have been resolved.

Moreover, the Examiner rejected claims 42 and 49 under judicially created doctrine of double patenting over claims 38 and 42 of copending Application No. 10/721,864, hereinafter referred to as "Combs II" in view of Brown. In response, the Applicants provisionally agree to file a terminal disclaimer, if necessary, to overcome the present judicially created doctrine of double patenting rejection when all other rejections against the pending claims of the present invention have been resolved.

The Examiner has also rejected claim 50 under judicially created doctrine of double patenting over claims 1-24 of Darcie in view of Pan and claims 1-8 of Combs in view of US Patent 5,521,734, issued on May 28, 1996, hereinafter referred to as "Frigo." In response, the Applicants provisionally agree to file a terminal disclaimer, if necessary, to overcome the present judicially created doctrine of double patenting rejection when all other rejections against the pending claims of the present invention have been resolved.

Finally, the Examiner rejected claim 50 under judicially created doctrine of double patenting over claims 38 and 42 of Combs II. In response, the Applicants provisionally agree to file a terminal disclaimer, if necessary, to overcome the present judicially created doctrine of double patenting rejection when all other rejections against the pending claims of the present invention have been resolved.

I. REJECTION OF CLAIMS 42, 49 AND 50 UNDER 35 U.S.C. § 103

A. Claims 42 and 49

The Examiner has rejected claims 42 and 49 in the Office Action under 35 U.S.C. § 103 as being unpatentable over Lu, et al. (US Patent 5,880,865, Issued March 9, 1999, hereinafter referred to as "Lu".) in view of Brown and further in view of Pan. Applicants respectfully traverse the rejection.

Lu teaches a wavelength division multiplexed network having broadcast capability. Lu teaches a WDM network that combines switched signals and a broadcast signal with a combiner. (See Lu, Col. 4, Line 58 - Col. 6, Line 16.) The combined signal is then fed into another splitter/combiner that includes various demultiplexers and signal splitters. (See *Id.*)

Brown teaches a cable television system with digital reverse path architecture. A headend, hub site and node form a reverse path architecture. (See Brown, Col. 2, Line 51 – Col. 3, Line 15.) RF signals are inputted and combined before being transmitted over an analog optical transmitter. (See *Id.*)

Pan teaches a hybrid analog and digital WDM access network with mini-digital optical nodes. Pan teaches a method of downstream transmission from the network to the users and a method of upstream transmission from the users to the network including steps of communicating the signals among a feeder/de/multiplexer, mini-digital nodes, optic fibers, a coax cable and/or digital line. (See Pan, Abstract.)

The Examiner's attention is directed to the fact that the alleged combination (as taught by Lu) fails to teach, show or suggest "a mini fiber node for receiving optical signals from a mux node, where the mini fiber node being further configured to communicate **analog and digital signals to end user equipment** via a wired connection", as positively claimed by Applicants' independent claims 42 and 49.

Specifically, Applicants' independent claims 42 and 49 recite:

> 42. A communication system, comprising:
> a mux node including a first lightwave interface device for communication with a head end, said mux node further including a second lightwave interface device for transmitting a plurality of optical signals, wherein at least two of the optical signals include both analog and digital signals, wherein said mux node includes a radio frequency signal compiler that enables frequency division multiplexing of a plurality of upstream signals received forma a corresponding plurality of mini fiber nodes; and
> a mini fiber node including a third lightwave interface device for receiving said optical signals from said second lightwave interface device of said mux node, said mini fiber node being further configured to communicate analog and digital signals to end user equipment via a wired connection. (Emphasis Added.)
>
> 49. A network node that communicates between a head end and a plurality of mini fiber nodes, comprising:
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> a first lightwave interface device for communication with a head end;
>
> a second lightwave interface device for transmitting a plurality of optical signals to a respective plurality of mini fiber nodes, wherein each of the plurality of mini fiber nodes being configured to communicate analog and digital signals to end user equipment via a wired connection, wherein at least two of the optical signals include both analog and digital signals; and
>
> a radio frequency signal compiler that enables frequency division multiplexing of a plurality of upstream signals received from a corresponding plurality of mini fiber nodes. (Emphasis Added.)

Applicants' invention teaches a mini fiber node for receiving optical signals from the mux node, said mini fiber node being further configured to communicate analog and digital signals to end user equipment via a wired connection. Specifically, one or more mux nodes receive signals from a head-end and forward the signals to one or more mini fiber nodes, which then forward the signals to the users. Applicants' use of mux nodes and mini fiber nodes reduces the number of optical fibers required to be connected to the head-end, thereby providing various advantages, e.g., increasing reliability and reducing power consumption. (See Applicants' Specification, Page 1, Line 18 – Page 3, Line 25.)

The alleged combination (as taught by Lu) fails to teach, show or suggest a mini fiber node for receiving optical signals from the mux node, said mini fiber node being further configured to communicate analog and digital signals to end user equipment via

a wired connection. The Examiner asserts that the ONU of Lu is a mini node. Applicants respectfully disagree.

First, Lu states that:

> "In accordance with the present invention, the problem is solved by interconnecting the ONUs, using a separate distribution facility, and sending the broadcast signal to only one selected ONU. This selected ONU then relays the broadcast signals to the other ONUs over the distribution facility." (See Lu, Column 1, lines 59-64, Emphasis added)

> "The resulting optical signal is then sent to ONU1 610. At ONU1 a demultiplexer 611 separates the 1.5 micron switched signal from the 1.3 micron broadcast signal. As previously described, the optical broadcast signal is demodulated and converted by distribution module (DM) 612 into the type of signal needed for distribution over facility 620 to the other ONUs." (See Lu, Column 5, lines 11-14, Emphasis added)

Thus, clearly, Lu teaches that only one selected ONU receives the broadcast signal and that selected ONU only distributes the broadcast signal to other ONUs. As such, there is not a single ONU as taught by Lu that is for receiving optical signals from the mux node, said mini fiber node being further configured to communicate **analog and digital signals to end user equipment** via a wired connection, as positively claimed by the Applicants. In other words, the ONU that receives the broadcast signal only communicates with other ONUs, and the other ONUs do not receive the broadcast signal from the splitter 604 of Lu.

This significant gap is not bridged by the teaching of Brown or Pan. Brown only teaches a headend, hub site and node form a reverse path architecture. (See Brown, Col. 2, Line 51 – Col. 3, Line 15.) Pan teaches that λ_1 represents an analog signal and that λ_2, λ_3, . . . λ_n represent digital signals. (See Pan, col. 8, ll. 25-27.) Pan specifically states that "[t]he one-way filter 44a only allows the analog-converted electrical signals (i.e. the digital signals only) to pass through in the downstream transmission." (See Pan, col. 9, ll. 31-34, emphasis added.) Moreover, Figure 1 in Pan shows that no λ_1 transmission (i.e. the analog transmission) is communicated to the end user. (See Pan, Fig. 1) Therefore, both Brown and Pan also fail to teach or suggest a mini fiber node for receiving optical signals from the mux node, said mini fiber node being further

configured to communicate **analog and digital signals to end user equipment** via a wired connection. Thus the alleged combination of Lu, Brown and Pan fail to make obvious Applicants' independent claims 42 and 49. Therefore, the Applicants' invention is not obvious over the combination of Lu, Brown and Pan. As such, the Applicants respectfully request the rejection be withdrawn.

B. Claim 50

The Examiner has rejected claim 50 in the Office Action under 35 U.S.C. § 103 as being unpatentable over Lu in view of Frigo and further in view of Pan. Applicants respectfully traverse the rejection.

The teachings of Lu and Pan have been discussed above. Frigo teaches a one-dimensional optical data arrays implemented within optical networks. A lowered cost optical network is achieved due to adoption of laser and receiver arrays in lieu of discrete transmitters and receivers. (See Frigo, Abstract.)

The Examiner's attention is directed to the fact that the alleged combination (as taught by Lu) fails to teach, show or suggest "a mini fiber node for receiving optical signals from a mux node, where the mini fiber node being further configured to communicate analog and digital signals to end user equipment via a wired connection", as positively claimed by Applicants' independent claim 50. Specifically, Applicants' independent claim 50 recites:

> 50. A network node that communicates between a head end and a plurality of mini fiber nodes, comprising:
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> a first lightwave interface device for communication with a head end;
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> a second lightwave interface device for transmitting a plurality of optical signals to a respective plurality of mini fiber nodes, wherein each of the plurality of mini fiber nodes being configured to communicate analog and digital signals to end user equipment via a wired connection, wherein at least two of the optical signals include both analog and digital signals; and
>
> a mux/demux/router component that is operative to receive electrical signals that have been converted from optical signals received from said head end, demultiplexes the received electrical signals, and forwards separate demultiplexed signals to said second lightwave interface device that transmits said separate demultiplexed signals to designated mini fiber nodes. (Emphasis Added.)

As discussed above, Lu teaches that only one selected ONU receives the

broadcast signal and that selected ONU only distributes the broadcast signal to other ONUs. As such, there is not a single ONU as taught by Lu that is for receiving optical signals from the mux node, said mini fiber node being further configured to communicate **analog and digital signals to end user equipment** via a wired connection, as positively claimed by the Applicants.

This significant gap is not bridged by the teaching of Frigo and Pan. Frigo only teaches that a lowered cost optical network is achieved due to adoption of laser and receiver arrays in lieu of discrete transmitters and receivers. (See Frigo, Abstract.) Pan teaches that only digital signals are communicated to end user equipment. (See *supra*.) Therefore, Frigo and Pan also fail to teach or suggest a mini fiber node for receiving optical signals from the mux node, said mini fiber node being further configured to communicate **analog and digital signals to end user equipment** via a wired connection. Thus the alleged combination of Lu, Frigo and Pan fail to make obvious Applicants' independent claim 50. As such, the Applicants respectfully request the rejection be withdrawn.

Conclusion

Thus, the Applicants submit that all of these claims now fully satisfy the requirement of 35 U.S.C. §103. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of a final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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